U.S. Department of Transportation
Office of the Secretary
of Transportation

General Counsel

1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

July 30, 2012

FILED ELECTRONICALLY

Ms. Marlene H. Dortch
Secretary, Federal Communications Commission
445 12th Street S.W.
Washington, D.C. 20554

> **Re:** **Notice of *Ex Parte* Meeting**
> **WT Docket No. 01-90 and ET Docket No. 98-95**
> ***Dedicated Short-Range Communications of Intelligent Transportation Services***

Dear Ms. Dortch:

Pursuant to the *Ex Parte* Rules of the Federal Communications Commission (FCC or the Commission), the United States Department of Transportation (DOT or the Department) submits this letter to summarize the discussion at a meeting conducted with FCC in these proceedings on July 26, 2012.

The following FCC personnel attended this meeting: Julius Knapp, Aole Wilkins, Navid Golshahi, and Brian Butler of the Office of Engineering and Technology; David Furth, Michael Wilhelm, Rasoul Safavian, Bhezad Ghaffari, and Nnake Nweke of the Public Safety and Homeland Security Bureau; and Tim Maguire and Scot Stone of the Wireless Telecommunications Bureau.

Attending on behalf of the Department were: Daniel Smith, Senior Associate Administrator for Vehicle Safety, National Highway Traffic Safety Administration (NHTSA); Raymond Resendes, Chief, Intelligent Technologies Research Division, NHTSA; Nathaniel Beuse, Director, Office of Crash Avoidance Standards, NHTSA; Dana Sade, Senior Counsel, NHTSA; Shelley Row, Director, Intelligent Transportation Systems Joint Program Office (ITS/JPO); John Augustine, Deputy Director, ITS/JPO; Walton Fehr, Manager, ITS Systems Engineering, ITS/JPO; Jane Mellow, Director, Governmental, International and Public Affairs, Research and Innovative Technology Administration (RITA); Vincent Valdes, Associate Administrator, Research, Demonstration and Innovation, Federal Transit Administration (FTA); and the undersigned, of the Office of the Secretary (OST). Renae Carter of the National Telecommunications and Information Administration (NTIA) also attended.

The purpose of the meeting was for the Department to provide the Commission with an update on the Department's efforts relating to Dedicated Short Range Communications (DSRC) and the development of Intelligent Transportation Systems (ITS). After providing some background information about the Commission's proceedings on DSRC and the history of ITS, the Department's staff conveyed several key points. First, ITS remains a priority for the Department and its operating administrations, including NHTSA, RITA, FTA, the Federal Highway Administration (FHWA), and the Federal Motor Carrier Safety Administration (FMCSA). The Department continues to invest significant resources in ITS research, testing, and other endeavors to help enable a connected transportation environment that will improve safety and mobility. Transportation safety is the top priority of the Department, and Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communications, which can provide driver warnings in several safety-critical scenarios, have the potential to significantly reduce vehicle crashes and fatalities (which totaled more than 32,000 in 2011). Thus, in the Department's view, these public benefits support the continued allocation of spectrum for DSRC.

Second, the Department provided the Commission with further information about its progress in analyzing the benefits of ITS and in testing this technology in real-world scenarios. Among various other endeavors, a Connected Vehicle Safety Pilot Model Deployment will begin in late August 2012 in Ann Arbor, Michigan. This will be a major effort involving approximately three thousand vehicles, permitting the Department to collect data for one year on how ITS can help to reduce vehicle crashes. The Department invited FCC staff to learn more about ITS by observing the Safety Pilot Model Deployment or by participating in a "hands-on" demonstration of the technology.

Finally, the Department explained that NHTSA has committed to a 2013 agency decision on whether the V2V safety technology (of which DSRC is a foundational element) is sufficiently developed to support rulemaking for light vehicles. Similarly, NHTSA has committed to a 2014 agency decision point on heavy trucks.

Attached is a copy of the Department's presentation from the meeting. A courtesy copy will be provided for circulation to those who attended on behalf of the Commission. Please feel free to contact me with any questions.

Respectfully,

/s/ Christopher S. Perry

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Enclosure

cc: David Furth
        Renae Carter

DEDICATED SHORT RANGE COMMUNICATIONS (DSRC)

Department of Transportation
Briefing to the Federal Communications Commission
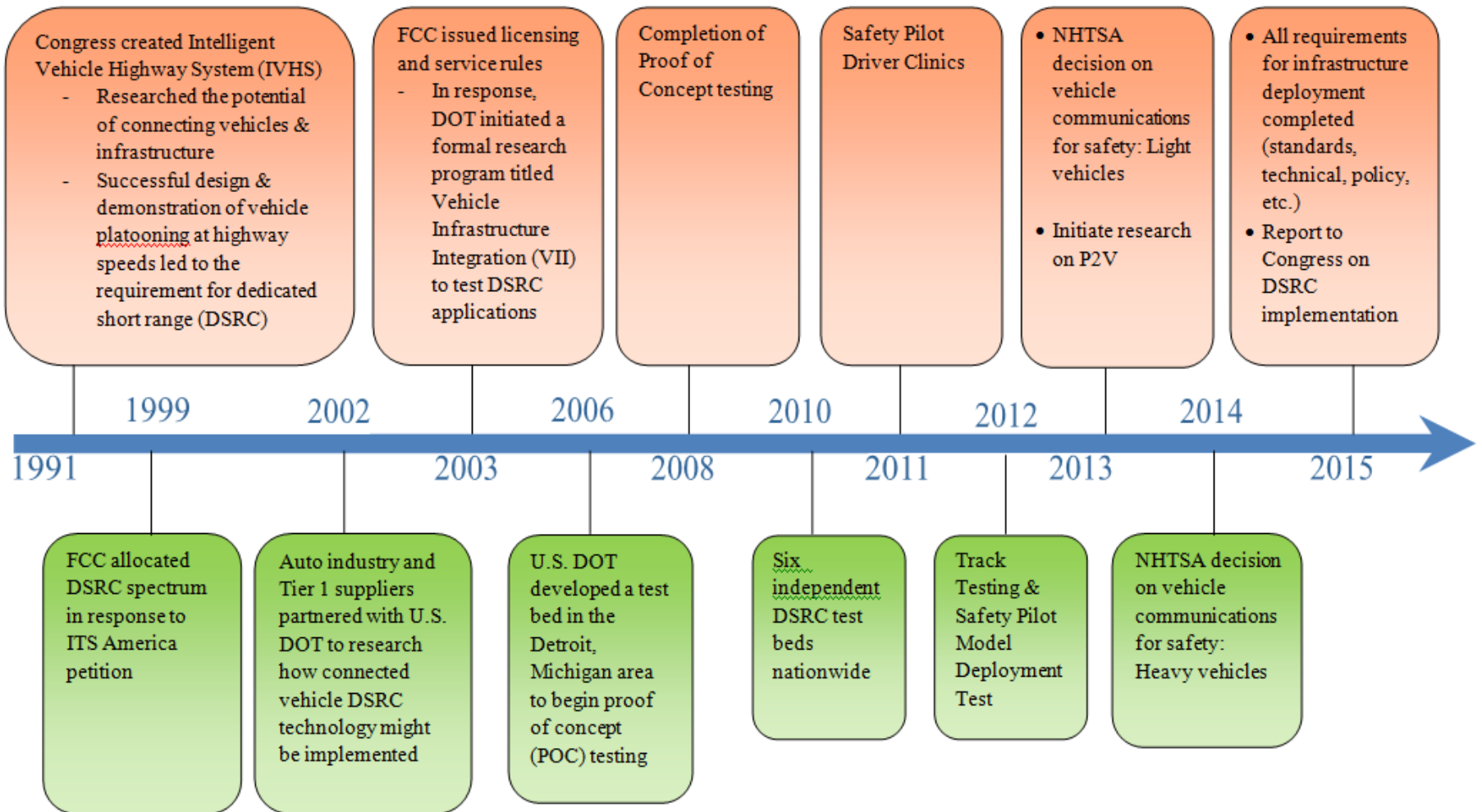
July 26, 2012

Agenda

- Introductions / DOT Overview
- ITS and DSRC Background
- Current Connected Vehicle Program
- Safety Pilot – Transition from Research to Deployment
- Conclusion
- Q&A

ITS and DSRC Background

Intelligent Transportation Systems (ITS) Program dates back over 20 years
Spans four separate U.S.DOT authorizations (ISTEA, TEA-21, SAFETEA-LU, MAP-21)

Congress created Intelligent Vehicle Highway System (IVHS)
- Researched the potential of connecting vehicles & infrastructure
- Successful design & demonstration of vehicle platooning at highway speeds led to the requirement for dedicated short range (DSRC)

FCC issued licensing and service rules
- In response, DOT initiated a formal research program titled Vehicle Infrastructure Integration (VII) to test DSRC applications

Completion of Proof of Concept testing

Safety Pilot Driver Clinics

- NHTSA decision on vehicle communications for safety: Light vehicles
- Initiate research on P2V

- All requirements for infrastructure deployment completed (standards, technical, policy, etc.)
- Report to Congress on DSRC implementation

Timeline: 1991 — 1999 — 2002 — 2003 — 2006 — 2008 — 2010 — 2011 — 2012 — 2013 — 2014 — 2015

FCC allocated DSRC spectrum in response to ITS America petition

Auto industry and Tier 1 suppliers partnered with U.S. DOT to research how connected vehicle DSRC technology might be implemented

U.S. DOT developed a test bed in the Detroit, Michigan area to begin proof of concept (POC) testing

Six independent DSRC test beds nationwide

Track Testing & Safety Pilot Model Deployment Test

NHTSA decision on vehicle communications for safety: Heavy vehicles

3

Background: DSRC Technology for Safety

- What it is
  - WiFi radio technology adapted for high speed environments
  - Inexpensive to produce in quantity
- How the technology works
  - Generates/receives messages at 10 times/second
    - Basic Safety Message (vehicle size, position, speed, heading, acceleration, brake system status)
  - Operating range of 300 meters
- Necessary for crash imminent situations
- Benefits of the technology over in-vehicle sensor only systems
  - More Crash Scenarios → Increased performance
  - Reduced Price
  - Fewer False Alarms
    - Can communicate around vehicles and blind intersections

ITS Background - Transportation Challenges

Safety

- 32,310 Fatalities in 2011
- 6,000,000 crashes/year
- **Leading cause of death for ages 4 to 34**

Mobility

- 4,200,000,000 hours of travel delay
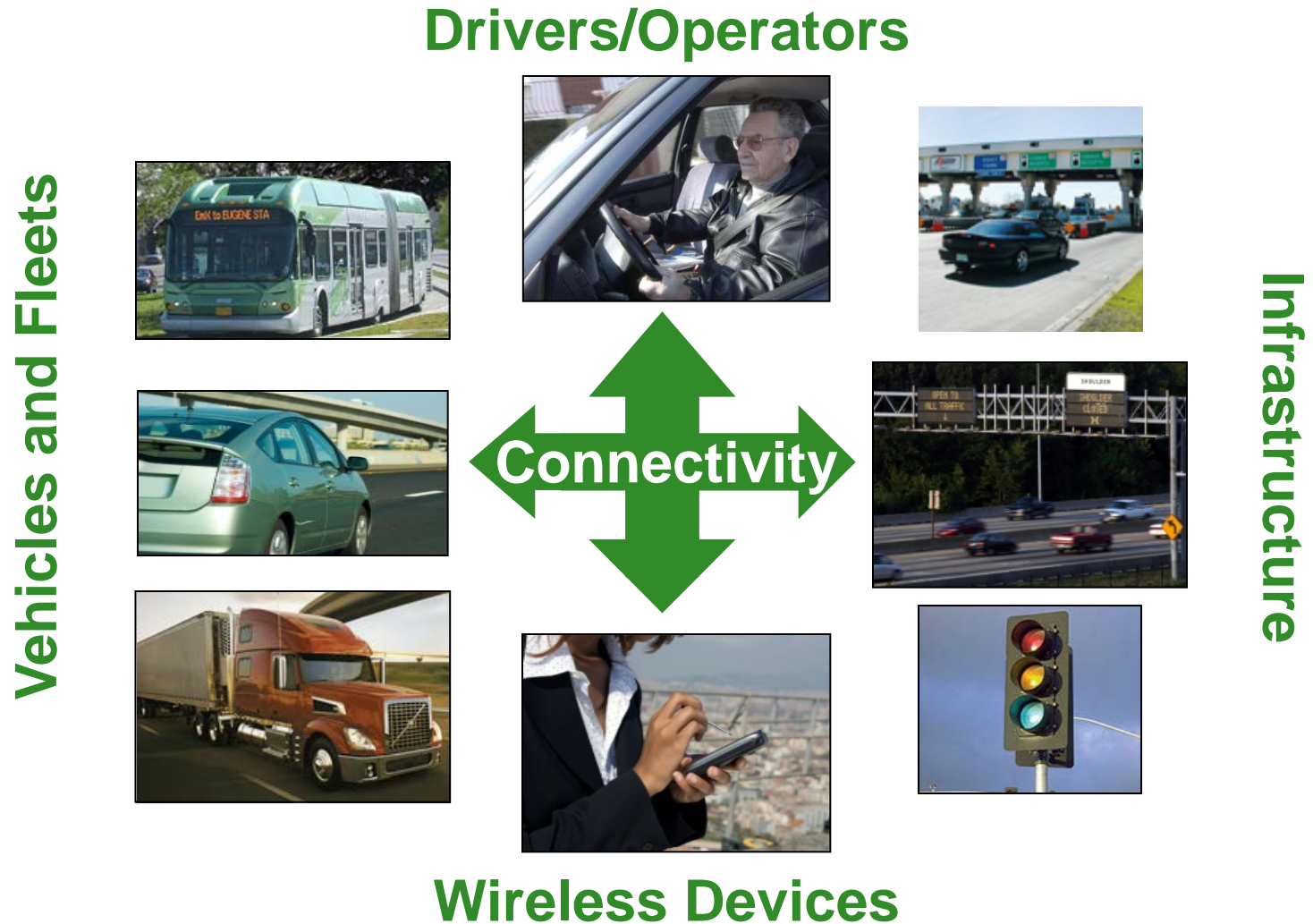- $80,000,000,000 cost of urban congestion

Environment

- 2,900,000,000 gallons of wasted fuel

Photo Source: Thinkstock

CO$_2$ CULPRITS

33%   33%

12%   22%

power plants
cars and trucks
major transportation
factories, home heating systems
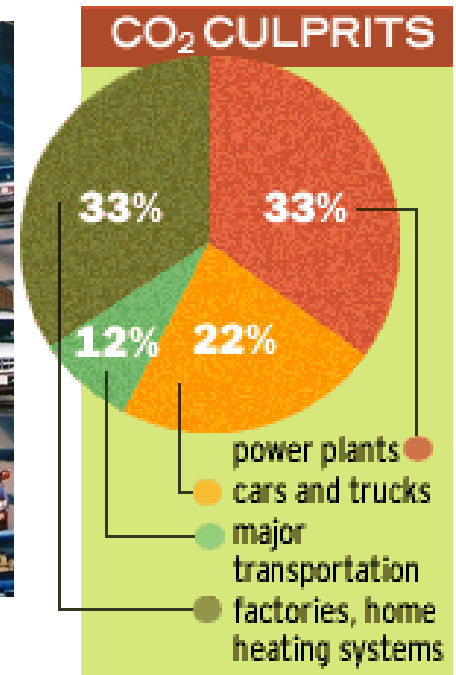
CURRENT RESEARCH – CONNECTED VEHICLES

Drivers/Operators

Vehicles and Fleets

Infrastructure

Connectivity

Wireless Devices

ITS Mobility Program

Real-time Data Capture and Management   **Mobility Applications**
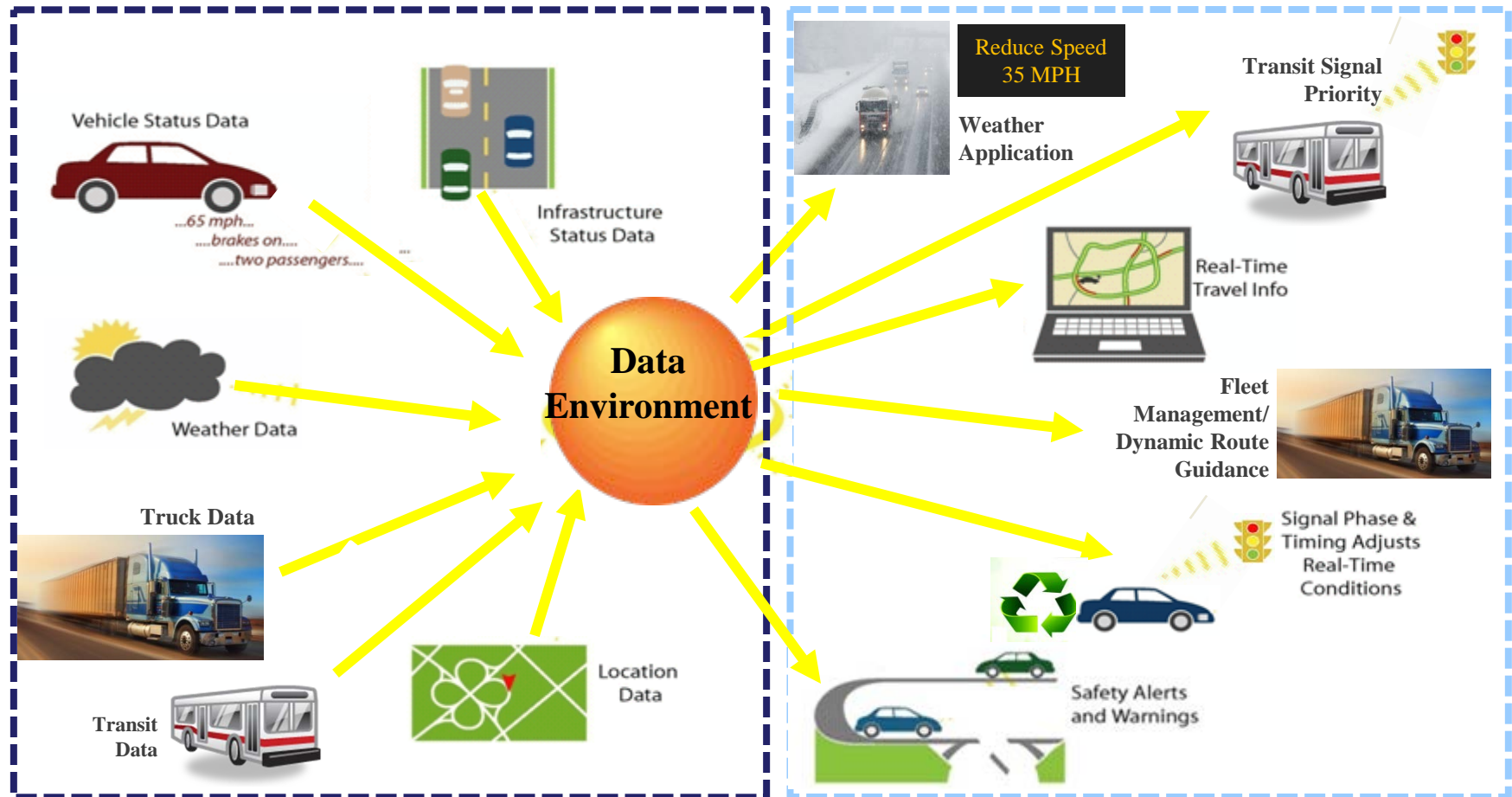
DSRC PROVIDES OPPORTUNITY FOR SAFER DRIVING

- Vehicle to Vehicle (V2V) Communications
- Vehicle to Infrastructure (V2I) Communications
- Greater situational awareness
  - Your vehicle can "see" nearby vehicles and knows roadway conditions you can't see
  - 360 degree "visibility"
- Reduce or even eliminate crashes through:
  - Driver Advisories
  - Driver Warnings
  - May assist future vehicle control

Connected vehicles have the potential to address approximately **80%** of vehicle crash scenarios involving unimpaired drivers

CONNECTED VEHICLE SAFETY EXAMPLE APPLICATIONS

V2V

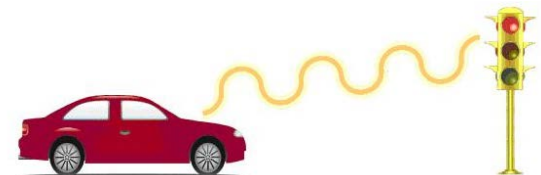Vehicles exchange situation information – speed, location, brake status, etc.

- Forward Collision Warning
- Emergency Electronic Brake Light
- Blind Spot/Lane Change Warning
- Do Not Pass Warning
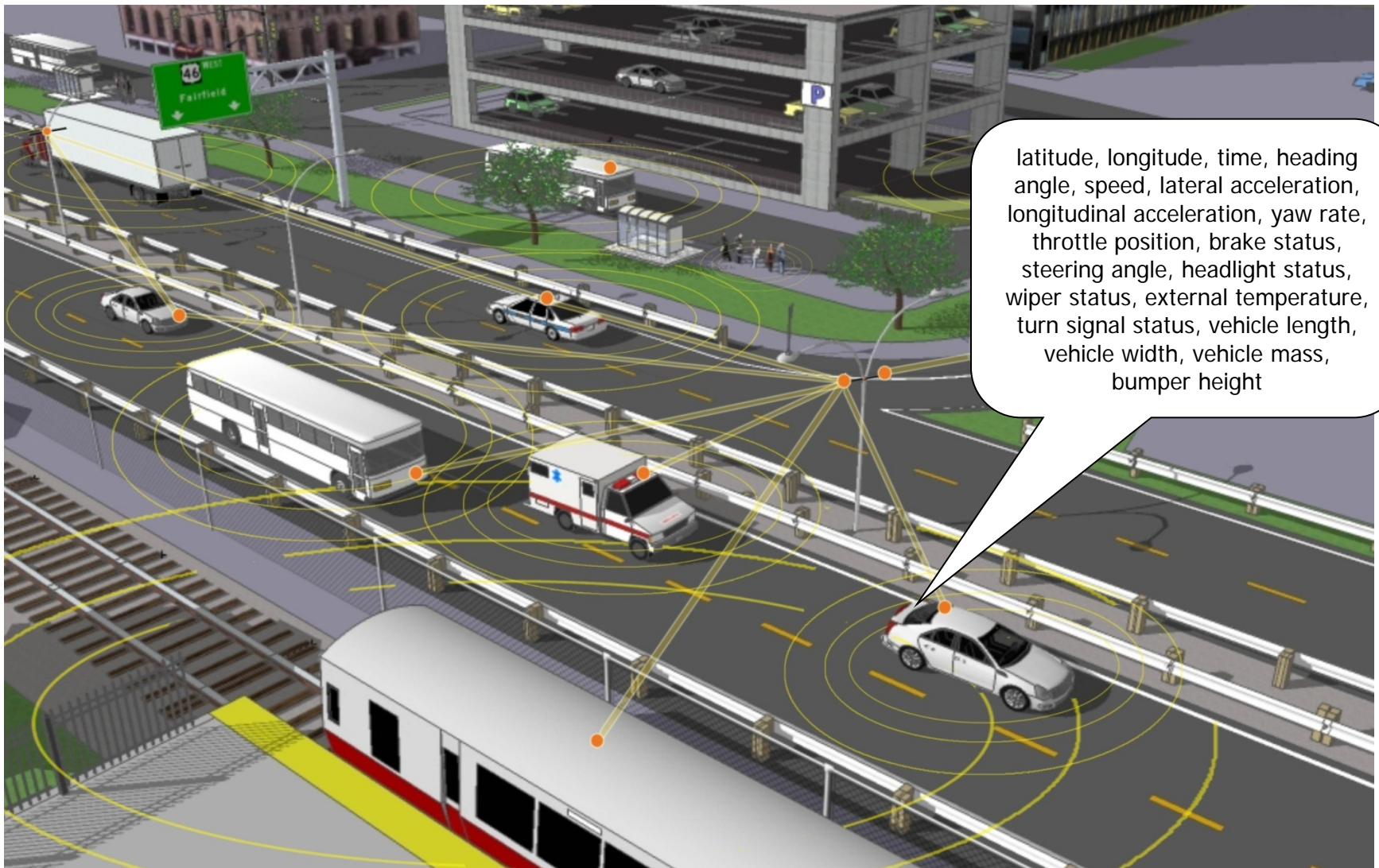- Intersection Movement Assist
- Left Turn Assist

V2I

Infrastructure sends situation information to vehicles –

- Curve Speed Warning
- Red Light Violation Warning
- Transit Pedestrian Detection

Fully Connected Transportation

latitude, longitude, time, heading angle, speed, lateral acceleration, longitudinal acceleration, yaw rate, throttle position, brake status, steering angle, headlight status, wiper status, external temperature, turn signal status, vehicle length, vehicle width, vehicle mass, bumper height

V2V Communications

- Vehicle warning applications proven

- Vehicle control applications being researched now

- Due to positive research results, NHTSA has committed to a 2013 Agency decision regarding whether the safety technology is sufficiently developed to support rulemaking for Light Vehicles

- NHTSA has committed to a 2014 Agency decision for Heavy Trucks

V2I Communications

- V2I safety, mobility, and environmental applications will be:
    - ❑ Developed, evaluated, and cost-benefit assessed in 2013-2015
- V2I Communications research will create a future environment that fosters public and private development of applications, some of which may require DSRC
    - ❑ Other communications modes, such as HD radio or cellular, may be sufficient for non-low latency applications (i.e. mobility)
- V2I Safety program is also developing enabling technologies for
    - ❑ Dynamic Mobility Applications (DMA), Data Capture & Management (DCM), Applications for the Environment: Real-time Information Synthesis (AERIS), Road Weather Management (RWM)
- FHWA committed to developing Final definition of V2I enabling technologies and Implementation Guidelines to assist public agencies making V2I investment and deployment decisions in 2015

Remaining Technical and Research Work

- Complete ongoing policy research to define final V2V security system / business model to support NHTSA 2013 and 2014 Agency Decisions

- Execute final Track Testing and Safety Pilot and provide necessary benefits and effectiveness data to NHTSA to support 2013 and 2014 Agency decisions

- Other remaining technical work:
  - Update from old American Society of Testing and Materials (ASTM) standard to current Institute of Electrical and Electronics Engineers (IEEE) standard
  - Finalize coordination with DoD and NTIA on radar and satellite spectrum sharing

Connected Vehicle Safety Program Partners and Contractors

TRANSIT

SAFETY

POLICY

TRUCKS

SAFETYPILOT

TRAFFIC SIGNALS
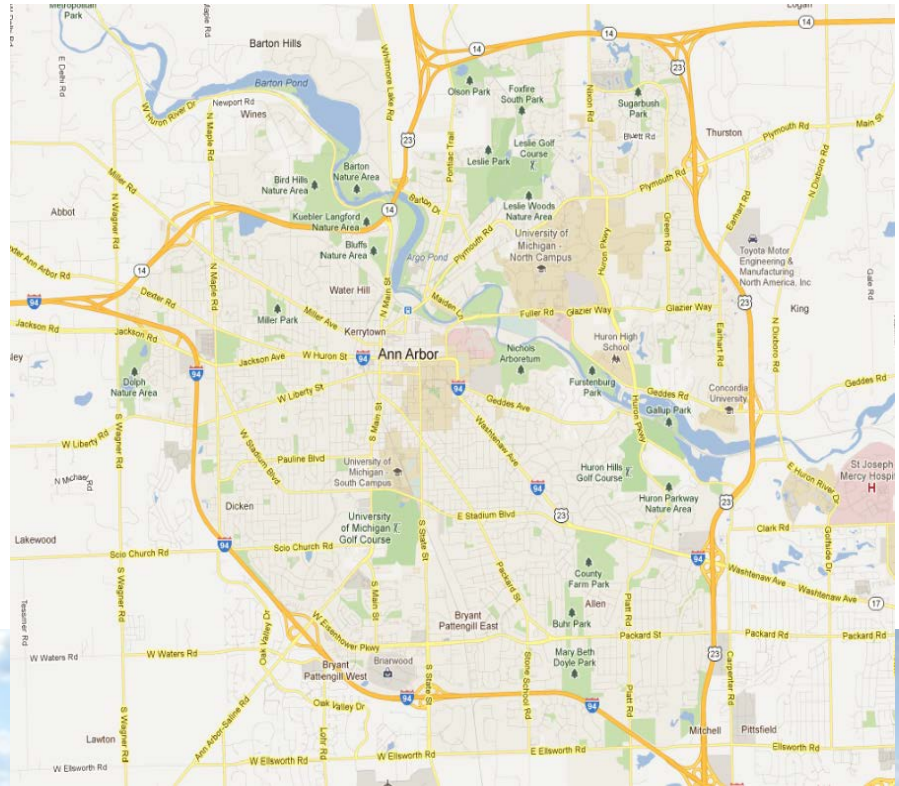
TESTING

STANDARDS

AFTERMARKET DEVICE

DATA

SECURITY

Safety Pilot Model Deployment

Ann Arbor, MI

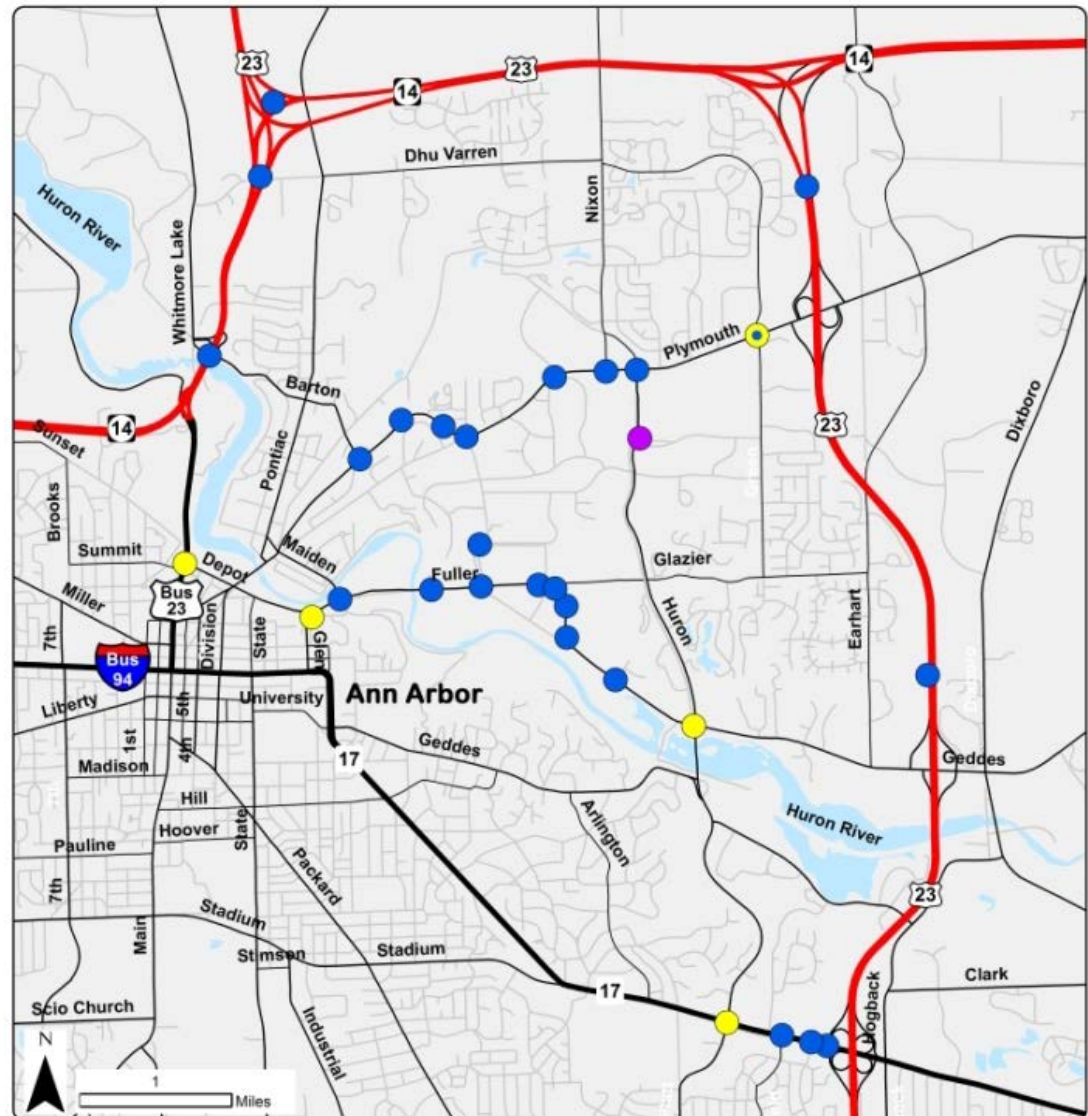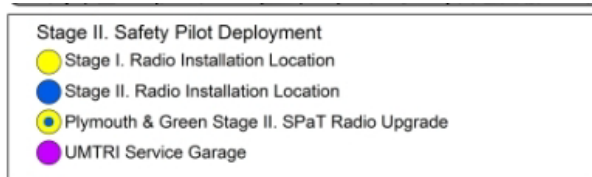August 21, 2012

SAFETY PILOT DEPLOYMENT SITE

Key Site Elements:
- 75 miles of instrumented roadway
    - 29 roadside units
- ~3000 vehicles
    - Cars, trucks, buses
    - Integrated, aftermarket, and retrofit
- 1 year of data collection

Also:
- Exercising security options
- Vetting device certification process

Stage II. Safety Pilot Deployment
- ○ Stage I. Radio Installation Location
- ● Stage II. Radio Installation Location
- ◉ Plymouth & Green Stage II. SPaT Radio Upgrade
- ● UMTRI Service Garage

User Acceptance -- Driver Clinics

- 6 locations across the U.S. - began in August 2011

- 100 drivers per location

- Experienced crash warnings
  - Forward Crash Warning
  - Emergency Brake Light
  - Blind Spot Warning
  - Lane Change Warning
  - Intersection Assist
  - Do Not Pass Warning

- Feedback from drivers was overwhelmingly positive
  - ~90% of drivers expressed desire for such a system

Future Research Work – Pedestrian to Vehicle (P2V) & Motorcycle to Vehicle (M2V)

- Pedestrians and Motorcyclists are vulnerable road users
- Pedestrians ~ 4,500 fatalities per year (13%)
- Motorcycles ~ 5,000 fatalities per year (15%)
- P2V and M2V may provide far better awareness for these road users, as well as for drivers of vehicles
- M2V applications need to be investigated
- P2V systems/applications need to be developed
  - Likely will require more stringent positioning, including increased DSRC bandwidth for precise position determination

Conclusion

- Continual progress with DSRC-based technology since spectrum allocation - industry standards have been developed continue to mature
- Research results have shown that **DSRC safety applications have potential to dramatically improve transportation safety**
- In addition to safety, DSRC data also supports a host of mobility and environmental applications
- Automobile industry and Tier 1 suppliers support the current Connected Vehicle Safety Program
- Safety Pilot will collect the data necessary to support the NHTSA 2013 and 2014 Agency Decisions
- Infrastructure deployment guidelines scheduled for 2015
- Connected Vehicle technology continues to be a high priority within the Department

Questions / Discussions